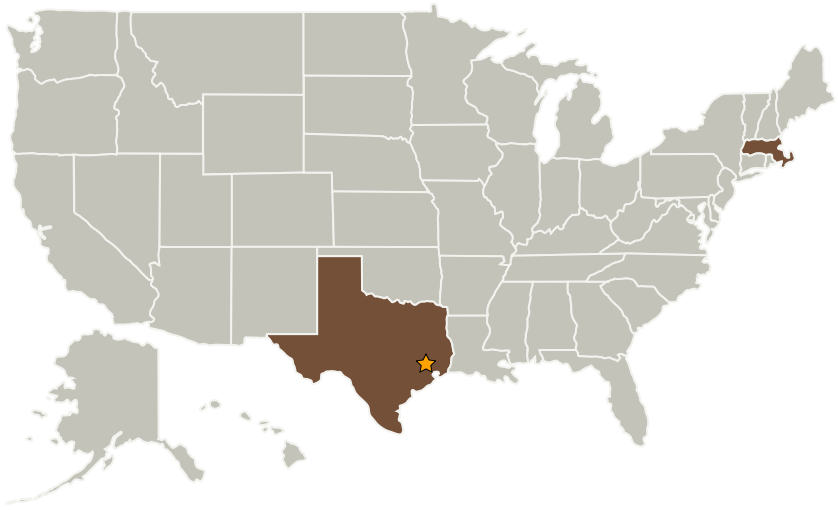
Flexible High-Barrier Polymers for Food Packaging, Phase II

Completed Technology Project (2009 - 2012)

Project Introduction

The development of a polymer laminate with water and oxygen barrier properties suitable for food packaging and preservation on 3-5 year manned space exploration missions is proposed. The laminate is a multilayer structure comprising polymer and inorganic dielectrics that will provide near-hermetic encapsulation of food items for the duration of these missions. In Phase I, flexible polymer barriers with an oxygen transport rate of <0.005 cc/m2-day and water transport rate of <0.005 g/m2-day were developed. The barriers contain no metal foils, have a areal density of <34 g/m2 for a 40 micron thick film, and tolerate high temperature sterilization treatments. The polymer laminates are mechanically robust exhibiting a 165MPa yield strength, 200MPa tensile strength, 550MPa tensile modulus, and 3% elongation to yield. In Phase II, we propose to optimize barrier properties to reduce weight, minimize ash on incineration, develop heat-sealing methods, and expand the testing to include heat sealed enclosures. The Phase II effort also includes a collaboration with a potential high-volume manufacturer of the barrier films for aerospace applications.

Primary U.S. Work Locations and Key Partners



Flexible High-Barrier Polymers for Food Packaging, Phase II

Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Organizational Responsibility	1
Project Transitions	2
Project Management	2
Technology Areas	2

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Flexible High-Barrier Polymers for Food Packaging, Phase II

Completed Technology Project (2009 - 2012)

Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
EIC Laboratories, Inc.	Supporting Organization	Industry	Norwood, Massachusetts

Primary U.S. Work Locations	
Massachusetts	Texas

Project Transitions

December 2009: Project Start

March 2012: Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.1 Materials
    - TX12.1.3 Flexible Material Systems